

Metal Oxide-Carbon Nanocomposites for Aqueous and Nonaqueous Supercapacitors, Phase II

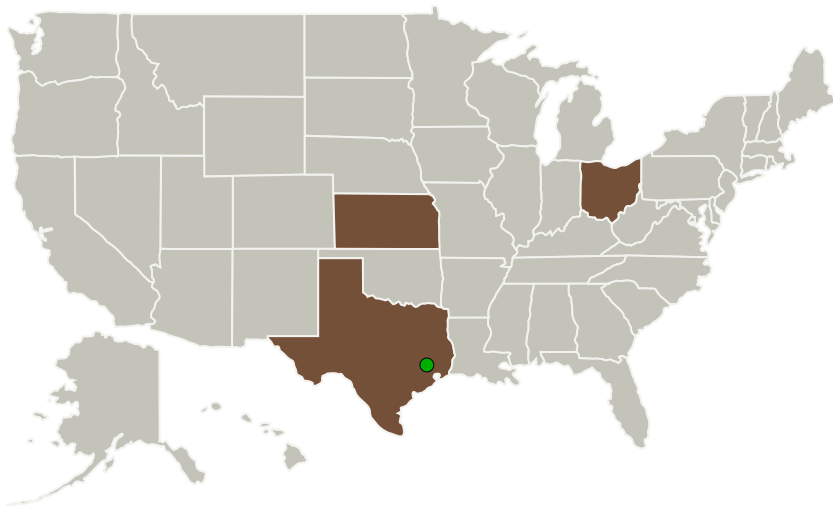
Completed Technology Project (2011 - 2013)



Project Introduction

This Small Business Technology Transfer Phase 2 effort focuses on development of a supercapacitor energy storage device based on novel metal oxide-carbon nanocomposites. In the Phase 1 project, NanoScale discovered a group of cathode nanocomposites with an exceptionally high capacitance of 270 F/g and a large potential window of 3.8 V versus metallic lithium in inorganic electrolytes. The combination of a large capacitance and a high achievable device voltage, allows for construction of hybrid supercapacitors with high energy and power densities and a very long lifetime. Importantly, the materials developed by NanoScale are easy to produce on a large industrial scale since no costly raw materials or manufacturing methods are required. In Phase 2, a complete supercapacitor system, including nanocomposite cathode and anode electrodes and nonaqueous low temperature electrolytes, will be tested and optimized. The proposed project will be a joint effort between NanoScale Corporation, Battelle Memorial Institute, the STTR partner, and Rayovac, a well known battery manufacturer. This team is uniquely qualified to carry out the proposed research due to its rich experience in manufacturing of nanoscale materials, supercapacitor development and large scale battery manufacturing. NanoScale and Battelle will jointly develop the proposed supercapacitor system. Rayovac will fabricate and evaluate prototype supercapacitors.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Nanoscale Materials, Inc.	Lead Organization	Industry	Manhattan, Kansas
Battelle Memorial Institute	Supporting Organization	R&D Center	Columbus, Ohio
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Kansas	Ohio
Texas	

Project Transitions

▶ **July 2011:** Project Start

✓ **July 2013:** Closed out

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Nanoscale Materials, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

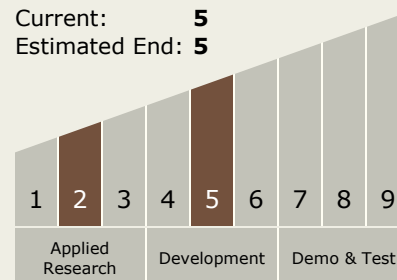
Carlos Torrez

Principal Investigator:

Slawomir Winecki

Technology Maturity (TRL)

Start: 2
Current: 5
Estimated End: 5



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.2 Energy Storage
 - └ TX03.2.1 Electrochemical: Batteries

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System